

REMARKS/ARGUMENTS

Claims 2-18 are pending in the current application. In the pending Office Action all of the pending claims were rejected. Claim 2 has been amended.

I. Priority claims

Applicants have amended the first paragraph of the specification to reflect the fact that application serial no. 10/265,202 has issued as U.S. Patent No. 6,648,015.

II. Claim rejections under 35 U.S.C. § 103(a)

Claims 2-18 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent 3,587,614 (“Burke”) in view of U.S. Patent 6,152,181 (“Wapner”). As explained in more detail below, Applicants assert that amended claim 2 is patentable over the combination of Burke and Wapner. Since claim 2 is the only independent claim, all of the other claims are dependent on claim 2. By definition, claims dependent on claim 2 are narrower than claim 2. Thus if the broadest pending claim, claim 2, is allowable over the combination of Burke and Wapner, then all of the other pending claims (claims 3-18) must also be allowable.

Claim 2 has been amended to require a “material transport system” that “is configured to controllably direct material flow through the intersection” between two microfluidic channels. Support for this amendment can be found in the application in paragraphs [0033] and [0034] on pg. 10, and in paragraph [0037] on pgs. 11-12. In general terms, a microfluidic system covered by claim 1 typically has a “channel network” made up of channels that can intersect in a variety of ways. See paragraph [0026] on pgs. 7-8. The “material transport system” specified in claim 2 must be capable of selectively directing fluid through at least one of those intersections so that fluid can be selectively directed to different portions of the microfluidic device. The ability to redirect fluid to different parts of the chips allows the microfluidic device to carry out complex experiments such as the nucleic acid sequencing operations described on pgs. 18-20 of the application.

For a reference, or combination of references, to render a claim obvious, the reference or combination of references must teach or suggest every claim limitation. MPEP § 2143.03. Neither Burke, nor the combination of Burke and Wapner, discloses the type of

material transport system required by claim 2. The devices disclosed in Burke are fluidic logic elements. Fluidic logic gates are analogous to electronic logic gates. So, for example, a fluidic AND gate would have two fluid inputs and one fluid output. When the flow of fluid into both of the inputs of the AND gate exceeds a given threshold, then there will be a flow exceeding that threshold exiting the output. In such a fluid logic gate, there is no separate “material transport system” selectively directing the flow of fluid into particular channels. In other words, Burke does not appear to disclose the concept of selectively controlling the flow at a particular intersection. Wapner also does not appear to disclose the concept of a material transport system that can selectively direct fluid through intersections. The only type of fluid direction that Wapner appears to disclose is the concept of having fluid move through a single channel using the fluid’s surface tension. There is no disclosure of how such a fluid direction system could controllably move fluid through a channel intersection. Therefore, the combination of Burke and Wapner cannot teach or suggest the “material transport system” limitation in amended claim 2.

Furthermore, Applicants assert that there is no suggestion to combine Burke and Wapner, so it would not be obvious to one of ordinary skill in the art to modify the system of Burke to include the optical detector disclosed in Wapner. For a combination of references to be used as the basis of an obviousness rejection, there must be some suggestion in the prior art of why it would be desirable to combine those references. See MPEP § 2143.01. The optical detector in Wapner (see Figure 16 and the accompanying text at col. 12 line 61 – col. 13 line 22) is used to monitor the movement of a droplet in a microscopic tube or channel. There is no suggestion in either Burke or Wapner of why anyone would possibly want to include such an optical detector in fluidic logic element. The monitoring of droplets in Wapner appears to be completely unrelated to the functioning of the logic circuits described in Burke. Thus, there appears to be no basis for the Examiner’s assertion that one of ordinary skill would be motivated to combine the teachings of Burke and Wapner. That means that the combination of Burke and Wapner does not disclose the element of a detector in conjunction with the other elements of amended claim 2.

Conclusion

For the foregoing reasons, Applicant believes all the pending claims are in condition for allowance and should be passed to issue. If the Examiner feels that a telephone

conference would in any way expedite the prosecution of the application, please do not hesitate to call the undersigned attorney.

Respectfully submitted,



Donald R. McKenna

Reg. No. 44,922

CALIPER LIFE SCIENCES, INC.

605 Fairchild Drive

Mountain View, CA 94043-2234

Direct: 650-623-0737

Fax: 650-623-0504

donald.mckenna@caliperls.com

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Signed: _____

